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May 5, 1995

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FEDERAL COMMUNICATIONS COMMISSION
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Mr. William Caton
Acting Secretary
Federal Communications Commission
Room 222
1919 M Street, N.W.
Washington, D.C. 20554

DOCKET FILE COPY ORIGINAL

Re: *ET Docket No. 95-18*
RM-7927

Dear Mr. Caton:

Transmitted herewith for filing on behalf of Newcomb Communications, Inc. is an original plus nine copies of its comments in the above-referenced proceeding. If there are any questions, kindly contact the undersigned counsel directly.

Sincerely,

Terri B. Natoli
Terri B. Natoli

Counsel for
Newcomb Communications, Inc.

Enclosure

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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MAY 5 1995

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)

Amendment of Section 2.106 of the)
Commission's Rules to Allocate)
Spectrum at 2 GHz for Use)
by the Mobile-Satellite Service)

ET Docket No. 95-18
RM-7927

DOCKET FILE COPY ORIGINAL

To the Commission:

COMMENTS OF NEWCOMB COMMUNICATIONS, INC.

Newcomb Communications, Inc. ("Newcomb"), by its Attorneys hereby submits its comments in the above-captioned proceeding and respectfully states as follows:

I. Background and Introduction

Newcomb is a licensee and operator of a data messaging and position determination system in the 1610-1626.5 MHz (1.6 GHz) frequency band.¹ Because Newcomb's current system operates on L-Band transponders aboard geostationary (GSO) domestic-fixed satellites (FSS) which were launched in 1988, Newcomb is presently exploring all potential alternatives for follow-on capacity once its system is no longer able to operate on these GSO FSS L-Band transponders. As such, Newcomb is vitally interested in, and strongly supportive of, proposed Commission rules or policies that would increase the options available for future service provision to providers of mobile satellite services (MSS) on both a domestic and international basis, particularly GSO MSS services like those presently provided by Newcomb. To that end, Newcomb endorses the proposal set forth in the above-captioned Notice of Proposed Rulemaking

¹ Newcomb Communications, Inc., 8 FCC Rcd 3631 (1993) (hereinafter "Newcomb Authorization Order").

(NPRM)² to allocate 70 MHz of spectrum in the 2 GHz band at 1990-2025 MHz (uplink) and 2165-2200 MHz (downlink) to GSO and low-earth orbit (LEO) mobile satellite services and to coordinate this allocation worldwide. While the NPRM seeks comments on a number of issues relating to a potential allocation at 2 GHz to MSS, Newcomb's comments herein will focus primarily on the public interest benefits of allocating additional spectrum for GSO MSS systems; the sharing of these frequencies between GSO and LEO MSS systems; and the Commission's methods for awarding licenses once an allocation has been made.

II. An Allocation Which Permits Both GSO And LEO MSS Systems At 2 GHz Is In The Public Interest

The Commission's NPRM seeks comment on whether the proposed new frequency allocation should be limited to either exclusive GSO or LEO use.³ The public interest would best be served by allocating the frequencies for both types of uses as each of these types of systems are capable of meeting different needs of the public. As Newcomb will explain in more detail below, while the LEO systems are designed to provide high-data-rate narrowband services, GSO MSS systems, like the system currently operated by Newcomb, presently serve the public's demand for high capacity, low-data-rate wide-band (LDRWB) applications. The GSO systems are proven technology and have been operational for a number of years. Expansion of this type of GSO MSS service into the 2 GHz band on both a domestic and international basis could be accomplished relatively quickly and economically initially through the authorization of "piggy-back" 2 GHz payloads aboard GSO satellites which are currently being constructed for launch in the near future in other frequency bands. These systems could then transition to dedicated

² In the Matter of Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service, ET Docket No. 95-18, RM-7927, released January 31, 1995 (hereinafter "MSS 2 GHz Reallocation NPRM").

³ *MSS 2 GHz Reallocation NPRM* at para 16.

2 GHz GSO systems, such as those proposed by CELSAT⁴ or PCSAT,⁵ at such time as those systems become operational. The LEO systems which have been recently authorized are still in the construction stages, and while these systems, once deployed, will no doubt bring untold public benefit in the form of high-data-rate, voice capability MSS, these systems are not yet an operational reality. Moreover, LEO MSS systems are being designed and optimized to serve different needs than those needs currently served by existing GSO MSS systems. Specifically, the LEO systems provide high-data-rate, narrow-band services which include voice and compressed video capabilities. While these services meet the needs of certain segments of the public, particularly those in remote and rural areas, the type of applications for which Newcomb's GSO mobile system serves are based on different needs, those which require only low-data-rate capability and do not require costly optimization for voice capability. Moreover, GSO systems are significantly less costly to deploy because of the relatively small number of spacecraft necessary to obtain full-time total coverage of United States *vis-a-vis* LEO systems which require multiple satellites to obtain full coverage.⁶ As a result, the economics of providing GSO mobile service on a global basis is very different than the economics of providing global LEO mobile service, which, because of the optimization for mobile voice and the multiple spacecraft requirement will run in the billions of dollars. Because of the exorbitant underlying LEO system costs *vis-a-vis* GSO MSS systems, those mobile service users which do not require voice capability for their mobile service applications would be forced to bear higher service rates

⁴ See CELSAT Petition For Rulemaking, RM-7927, February 6, 1992 (hereinafter "CELSAT Petition"); CELSAT Amendment to Petition For Rulemaking, July 7, 1993 (hereinafter "CELSAT Amendment").

⁵ See In the Matter of Personal Communications Satellite Corporation, Application for Authority to Construct a Domestic Communications Satellite System for the Provision of Mobile Satellite Service, April 7, 1994 (hereinafter "PCSAT Application").

⁶ See CELSAT Petition at p.19.

from LEO providers, which necessarily result from the higher system costs, if lower cost GSO alternatives were not available. Through allocating the 70 MHz of spectrum proposed at 2 GHz to both GSO and LEO MSS systems, the Commission will enable the public to have access to a multitude of MSS services with varying data-rates and capabilities, yet at prices which more appropriately and reasonably reflect the costs of providing only the particular MSS service desired by a particular user.

III. The Public Interest Benefits of Low Data-Rate High-Capacity Wide-Band GSO Mobile Satellite Service is Proven

The benefits of LDRWB mobile satellite service using code division multiple access (CDMA) technology aboard GSO satellites is proven. Newcomb has been providing such service to the public for over three years and demand for this service is growing by leaps and bounds. Similar service is also being provided by other licensees.⁷ This service includes critical distress and safety applications which mitigate the risk of dangerous, but essential, operations to various types of users. Newcomb's services are presently used by U.S. government military and law enforcement as well as commercial customers for both maritime and aeronautical applications such as automatic aircraft tracking, providing positive identification, position reporting, on-board data reporting, and manual messaging for both fixed and rotor winged aircraft. Critically important is that capability of Newcomb's service to provide frequent automatic position reporting which substantially and significantly narrows potential search areas in the event of air disaster or mishap. These life-saving services are currently used by the US Coast Guard in its search and rescue helicopter operations to enhance crew safety and search pattern verification; by federal government law enforcement agencies for overt and covert tracking and coordination

⁷ See Letter to Counsel, Mobile Data Communications, Inc. from Chief Domestic Facilities Division (August 19, 1993); See also, Mobile Datacom Corporation, *Order and Authorization*, Call Sign E930216, April 3, 1995.

of field operations; by U.S. military for tactical and logistical coordination; by hospital emergency medical service helicopters for coordination of landing sites; as well as civilian flight operations, such as private air taxi services for flight following and filing of flight plans. In addition, other applications of an aeronautical nature include the US Army Special Operation's use of Newcomb's system to track field maneuvers for improved coordination, safety and identification to enhance national defense efforts. Newcomb's system is used for similar maritime-related applications which include enhanced fleet coordination and improved safety of life and property. In the last thirty-day period, Newcomb's system carried over 540,000 messages, many related to safety of crew in remote operations. The worldwide extension of the benefits of system's like Newcomb's, can be achieved rapidly and economically, by allocating a portion of this 2 GHz spectrum to GSO MSS service and by authorizing such service to be offered, at least initially, through transponders aboard GSO satellites which are already being constructed to operate in other frequency bands.

IV. Authorizing GSO MSS Systems at 2 GHz Will Result In The Most Economic And Efficient Means Of Bringing The Benefits of GSO LDRWB MSS Service To The American Public And The World

The type of mobile messaging services currently provided by Newcomb and others can most economically and rapidly be provided through 2 GHz transponders aboard GSO satellites authorized to operate in other frequency bands. This avoids the extremely high cost of dedicated LEO systems which require multiple satellites and are designed to accommodate high-data-rate applications not required by all users. In addition, dedicated GSO MSS systems at 2 GHz will be optimized to accommodate a variety of mobile services which may not be required by LDRWB users. Moreover, the construction and launch costs of a dedicated system, whether it be an LEO or GSO system, are significantly higher than the cost for "piggy-back" payloads which permit service providers like Newcomb to obtain only the transponder capacity required

to provide efficient total-area coverage. Newcomb could continue to provide its existing services and expand nationally at 2 GHz via only one transponder aboard a GSO satellite located near the center of the U.S. orbital arc. Moreover, by using CDMA or spread spectrum technology a widely-recognized effective bandsharing technique, as opposed to other technology types such as time division multiple access (TDMA) or frequency division multiple access (FDMA), multiple GSO MSS licensees can use the same frequencies.⁸ Indeed, for services like those provided by Newcomb, multiple licensees could actually utilize the very same GSO transponder resulting in even greater efficiencies to the public.

On a global basis, the advantages of a GSO allocation at 2 GHz in enabling service to be provided worldwide is overwhelming. Because of the characteristics of GSO systems, it is not necessary that each international region where MSS service is desired to be provided allocate the identical frequencies as the US for this service. Unlike with LEO systems, where the same satellites continuously see different parts of the world, GSO satellites remain constant over the region of their footprint. Thus, a fully-connected GSO MSS system employing frequency-agile transceivers, could have satellites operating at different frequency bands worldwide, whereas LEO systems must all operate on the identical bands. The interconnectivity of the GSO systems can be achieved by employing transceivers such as those designed and utilized by Newcomb which give the user the capability to communicate with GSO satellites in different parts of the world which may allocate frequencies other than the 2 GHz band to this service. In other words, as the transceiver moves from the footprint of one GSO satellite in one frequency band to the footprint of a GSO satellite which may be operating in another frequency band, the transceiver will shift frequencies for continuous communication capability. This is unlike the

⁸ See CELSAT Amendment at Section 2C; See also, PCSAT Application at Section VI-B.

situation with LEO systems, which require the identical frequency bands worldwide for global coverage. Because of the frequency agility of GSO MSS system transceivers, international coordination efforts and the ability to reach service agreements with other countries is significantly enhanced. As a result, global GSO MSS services resulting from an allocation of the 2 GHz band in the US to GSO MSS systems could occur within a two to three year time span. This is compared to worldwide LEO systems which may take as long as ten years to become fully operational.

**V. A Spectrum Sharing Plan Assigning Separate Segments Of
The 2 GHz Band To GSO And LEO Satellites
Would Minimize Non-Compatibility And Interference Issues**

Newcomb believes that GSO and LEO MSS systems employing CDMA technology could co-exist on a co-primary basis in the 2 GHz band proposed by the Commission. High power GSO systems like Newcomb's system using 10-40 watt EIRP across a broad spectrum, put only a fraction of their energy into any single narrow spectrum channel such as will be used by the LEO's. Conversely, narrow channel applications contribute interference over only a fraction of the bandwidth used by a broad-band GSO system. These factors significantly ease interference coordination so as to allow both types of systems to co-exist. This notwithstanding, were the Commission to divide the allocation equally into a GSO segment of 17.5 MHz for the uplink and downlink and a corresponding LEO segment of 17.5 MHz in both directions, issues of interference and non-compatibility would disappear as between the two types of systems. Inference and coordination issues would still exist between competing GSO MSS systems and competing LEO MSS systems within the respective bandwidth specifically assigned each, yet these issues would be easier to resolve once the orbit of the systems were the same.⁹ As more

⁹ Newcomb's wide-band system could co-exist within a 17.5 MHz segment of bandwidth with a CELSAT or PCSAT system which contemplate narrowband applications in the

sensitive GSO transponders become available at 2 GHz with larger antennas aboard the satellites, and Newcomb transitioned its service to these transponders, it would adapt its system accordingly by reducing its power requirements so that it conformed to the power flux density constraints of the other GSO systems operating at 2 GHz to further ease coordination. GSO mobile systems currently provide mobile service very effectively over less than 17.5 MHz of bandwidth, i.e., 16.5 MHz in the 1610-1626.5 band.¹⁰ Therefore, a 17.5 MHz allocation for each of the uplink and the downlink is feasible. Moreover, 17.5 MHz of bandwidth in each direction would suffice for CDMA LEO MSS systems, as the LEO systems currently authorized and under construction will have available only 11.35 MHz of spectrum for their uplink.¹¹

If, at a later time, the Commission determines that a different division of this frequency band would better serve the public interest based on actual demand for licenses in the GSO versus LEO segment, a mechanism could be implemented for reallocating a portion of the spectrum assigned to the "under-demanded" service to the other. A mechanism of this sort was proposed by LEO applicants in a "Joint Proposal and Settlement Agreement" in CC Docket 92-166 filed on September 9, 1994. This proposal addressed, *inter alia*, the potential reassignment of under-demanded spectrum allocated between CDMA LEO systems and TDMA LEO systems in the 1.6 GHz frequency band.

Finally, by dividing the 2 GHz spectrum into discreet segments for the provision of MSS service by GSO and LEO licensees, the vastly different economic considerations between these

same way it could co-exist compatibly with the LEO narrowband systems.

¹⁰ See In the Matter of Amendment of Section 2.106 of the Commission's Rules to Allocate the 1610-1626.5 MHz and the 2483.5-2500 MHz Bands for Use by the Mobile Satellite Service, Including Non-Geostationary Satellites, 9 FCC Rcd 536 1994.

¹¹ In the Matter of Amendment of the Commission's Rules To Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands, *Report and Order*, 9 FCC Rcd 5936 (1994)

two types of systems can be accommodated more equitably in a regulatory environment where competitive bidding may ultimately be necessary to award licenses. Otherwise, given a full 35 MHz spectrum allocation to both services on a co-primary basis, and forcing those services to compete for licenses against one another or, even worse, to bid against one another in a competitive bidding process, when the costs and public interest benefits of the two types of services differ, would not result in an equitable assignment of licenses.

VI. Competitive Bidding Should Be Used Only As A Last Resort

While the Commission has the authority under Section 309(j) (1) and (2) of the Communications Act, as amended, 47 U.S.C. §309 (j)(1), (2) to use competitive bidding for awarding licenses, the *sine qua non* of the Commission's use of competitive bidding is the existence of mutually exclusive applications. As Newcomb has indicated above, at least with respect to GSO MSS systems at 2 GHz, multiple licensees could co-exist compatibly, particularly if the spectrum were divided so as to separate the frequencies used by the GSO licensees from those used by the LEO licensees. Newcomb submits that numerous GSO MSS licensees could co-exist compatibly in paired 17.5 MHz segments of the proposed 2 GHz allocation. Given this number, it would appear unlikely that a mutually exclusive situation would arise for GSO licenses particularly if the prospective licensees undertook coordination efforts similar to those currently employed in the FSS environment. Should such a situation arise, the applicants should be given a reasonable period of time within which to resolve the mutually exclusive issues so long as this period of time does not adversely affect the introduction of 2 GHz GSO MSS service to the public.

If, as a last resort, it is necessary to utilize competitive bidding because issues of mutual exclusivity cannot be resolved, then the bidding process must, at a minimum, consider and

provide for the differences in GSO *vis-a-vis* LEO systems, both as to the number of spacecraft required for full coverage and the service capabilities.

VII. Conclusion

In conclusion, Newcomb commends the Commission for undertaking yet another proceeding designed to bring the benefits of mobile satellite technology to the US public and the world. To this end, Newcomb supports the Commission's proposal to allocate the 1990-2025 MHz and 2165-2200 MHz for use by both GSO and LEO mobile satellite service providers. Furthermore, as set forth above, Newcomb asserts that the most effective spectrum sharing plan for GSO and LEO systems would result if the Commission assigned an exclusive GSO segment of 17.5 MHz and an exclusive LEO segment of 17.5 MHz in each direction. Exclusive assignments would minimize coordination issues as well as inequities which may arise in licensing the two operationally and economically different types of systems. Finally, Newcomb urges the Commission to permit GSO mobile systems to be provided immediately upon GSO transponders aboard GSO satellites currently under construction with the eventual plan to relocate these systems to dedicated 2 GHz GSO satellites when they become operational.

Respectfully submitted,

NEWCOMB COMMUNICATIONS, INC.

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Counsel for Newcomb Communications, Inc.

May 5, 1995
25392

CERTIFICATE OF SERVICE

I, Gail Marie Baker, hereby certify that copies of the foregoing comments of Newcomb Communications, Inc. in ET Docket No. 95-18 was served by hand, unless otherwise specified this 5th day of May, 1995 on the following persons:

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